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THE
ONTARIO WATER RESOURCES
COMMISSION
WATER POLLUTION SURVEY
of the
VILLAGE OF PETAWAWA
COUNTY OF RENFREW

1966

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THE
ONTARIO WATER RESOURCES
COMMISSION

Report on a
WATER POLLUTION SURVEY
of the
VILLAGE OF PETAWAWA
in the
COUNTY OF RENFREW

Division of Sanitary Engineering

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WATER POLLUTION SURVEY

of the

VILLAGE OF PETAWAWA

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WATER POLLUTION SURVEY

of the

VILLAGE OF PETAWAWA

INTRODUCTION

A water pollution survey of the Village of Petawawa was performed during the period of August 10 to 12, 1965. Surveys of this type are made by the Ontario Water Resources Commission staff in order to locate existing and potential sources of surface-water pollution. Recommendations are made concerning the abatement of conditions which exert adverse effects on water quality. Appended to the report is a map of the village showing the locations of sampling points.

INTERVIEWS

Discussions were held with the following officials during this survey:

Mr. T. Marshall, Clerk-Treasurer;

Mr. W. Mohns, Councillor and Chairman of Public Works Committee;

Mr. L. G. Perrin, Works Superintendent;

Mr. J. Watt, Chief Public Health Inspector, Renfrew County Health Unit.

VILLAGE OF PETAWAWA

This municipality is located approximately eight miles north-west of the Town of Pembroke in the County of Renfrew. Highway 17 extends through the village. According to the 1965 Municipal Directory, the population of Petawawa was approximately 1,912 during the previous year. The area of the village is

approximately 1,390 acres.

The Village of Petawawa was incorporated in 1960, having existed previously as a community within the Township of Petawawa. The Petawawa Military Camp (Department of National Defence) is located on the north side of the Petawawa River near the village. It is obvious that the proximity of the military site has accelerated the growth of the village, particularly with respect to the Permanent Married Quarters which are provided within the village for military personnel.

The Petawawa River forms the northern boundary of the Village of Petawawa. The eastern part of the village lies near the Ottawa River although the municipality does not extend to this watercourse.

WATER USES

Municipal

The waters of the Petawawa River are not utilized for municipal purposes in Petawawa.

Industrial and Commercial

The Petawawa River receives waste flows from the plant operated by Giesebrecht's Limited, and from the premises of Petawawa DeLuxe Cleaners and Launderers Limited.

Recreational

Although a very popular bathing area exists on the bank of the Ottawa River east of the mouth of the Petawawa River, it has been

proposed as a centennial project to develop a bathing area on the south bank of the Petawawa River near the Department of National Defence storm sewer outfall. Reportedly, the DND storm sewer outlet might be relocated slightly to divert any storm water flows downstream from the proposed bathing area.

Private

A tributary of the Petawawa River receives the effluent from the waste stabilization pond which serves the Woodlawn Mobile Homes Limited development within the village.

Water Supply

Approximately 90 per cent of the residents of the village obtain water from the Camp Petawawa water works. This plant is located on DND premises north of the village and the water is drawn from the Ottawa River. The OWRC provided assistance in the extending of water mains in the village.

The existing DND water treatment facilities provide screening, settling, and chlorination. Problems associated with taste, odour, colour and iron content are encountered to some extent. Recent information indicates that the DND proposes to construct a new water purification plant at Camp Petawawa to have an approximate treatment capacity of three million gallons per day. The existing water storage facilities consist of a standpipe having a reported capacity of 0.25 million gallons.

SURFACE WATER DRAINAGE

The topographical features of the Village of Petawawa are such that surface run-off flows tend to drain either to the Petawawa River or to its tributary which extends through the municipality. This tributary has its source beyond the village, and flows through the western part of the municipality to empty into the Petawawa River downstream from the C.P.R. bridge. A DND storm sewer terminates on the south bank of the Petawawa River opposite the junction of Portage Road and Violet Street within the village.

SEWAGE DISPOSAL FACILITIES

The major part of the village is served by private sub-surface sewage disposal systems. The construction of new systems is supervised by the Renfrew County Health Unit staff, and building permits are issued only if the health unit staff grants approval of the site for sewage disposal requirements. The municipal by-laws require that a building lot shall have a minimum frontage of 60 feet, that the minimum area shall be 7,500 square feet where a public water supply is provided, and 15,000 square feet where neither water nor sanitary sewer services are utilized. Reportedly, the overburden in the Village of Petawawa is predominantly sand and gravel.

The DND sewage treatment plant is located near the Ottawa River in the Township of Petawawa, just east of the village. This plant receives sewage flows from the military camp and from the Permanent Married Quarters area provided within the Village of Petawawa for military personnel. Reportedly, sewage is discharged

from the shopping centre to the plant. The sewage originating at the military camp flows under the Petawawa River via an inverted syphon from which, reportedly, there is no overflow. The DND sewage treatment facilities were constructed during 1960 and are situated approximately 1,500 feet from the Ottawa River. This plant provides primary treatment and utilizes pre-aeration and two-stage heated sludge digestion facilities. An emergency by-pass arrangement would allow influent flows to be diverted to the outfall sewer which extends into the Ottawa River. Effluent chlorination is practised throughout the year.

INDUSTRIAL AND COMMERCIAL OUTFALLS

Industrial activity in the Village of Petawawa is limited in extent. Giesebrecht's Limited is a firm which produces carbonated beverages. Sanitary wastes are discharged from the plant to a septic tank, the effluent from which combines with the industrial waste to discharge to the Petawawa River.

The Petawawa DeLuxe Cleaners and Launderers Limited plant is located adjacent to that of Giesebrecht's Limited, with both premises being situated on the west side of Doran Street (Highway 17) near the Petawawa River. Sanitary sewage is discharged from the Petawawa DeLuxe Cleaners and Launderers Limited plant to a sub-surface disposal system. The laundry waste is discharged through an outfall pipe to the Petawawa River. The location of the aforementioned premises is relatively remote from the area which is served by sanitary sewers.

PRIVATE OUTFALLS

The Woodlawn Mobile Homes Limited premises are located west of Doran Street and north of Portage Road. Accommodation is provided for approximately 40 mobile homes. Sewage flows are conducted by a collector sewer to a waste stabilization pond which reportedly was constructed by the firm in approximately 1958. The estimated measurements of this lagoon are approximately 225 feet in length, 70 feet in width, while the depth could not be ascertained readily. A freeboard of three feet was evident on August 11, 1965. The grass on the dykes of the lagoon required cutting. No adverse odours were observed at the lagoon. Effluent was discharging through a short asbestos-cement outfall pipe to a creek which empties into the Petawawa River. The discharge from the lagoon was occurring at its liquid level.

MUNICIPAL REFUSE DISPOSAL SITE

The site utilized by the village for refuse disposal is located approximately 1.5 miles south-west of the municipality in the Township of Petawawa. An inspection of the refuse disposal site was made during this survey, revealing that the site is not located near a watercourse. The refuse is deposited in a trench, and then is burned. The residue is covered with earth material. Reportedly, no refuse collection service is provided in the Village of Petawawa. This service would encourage residents to avoid the accumulation of refuse such as that existing on the bank of the

Petawawa River at the rear of the Giesebrecht's Limited plant where debris including broken glassware is strewn. Combustible refuse was burning on the river bank at this location during the survey.

SAMPLING PROCEDURE

The sampling of watercourses and pertinent outfalls at Petawawa was performed on August 11, 1965. The appended map of the village indicates the locations of sampling points. The pertinent laboratory results are appended in Tables I and II.

The weather was clear on August 11, 1965, with the maximum atmospheric temperature being approximately 76 degrees Fahrenheit. A moderate rainfall occurred during the forenoon of August 12.

INTERPRETATION AND SIGNIFICANCE OF LABORATORY RESULTS

The analyses employed to determine the quality of samples were: biochemical oxygen demand (BOD), solids, tests for anionic detergents as ABS, and the enumeration of coliform organisms. Additional analyses were performed on two samples of wastewater to determine the pH and alkalinity.

The BOD of sewage or polluted water is the oxygen required during stabilization of the decomposable organic or chemical material by aerobic biochemical action. A five-day BOD determination with incubation at 20 degrees Centigrade is reported. The BOD of a watercourse should not exceed four parts per million (ppm).

The analyses for solids include tests for total, suspended and dissolved solids. The results are reported in parts per million.

The first test measures both the solids in solution and in suspension. The test for suspended solids indicates the measure of undissolved solids of organic or inorganic nature in suspension. Significant causes of suspended solids in watercourses are land erosion and waste discharges. Suspended solids in water can present difficulties in water purification and can interfere with the habitat of aquatic life. The dissolved solids are a measure of those solids in solution.

The presence of anionic detergents as ABS usually is an indication that domestic waste is contained in the sample.

The coliform count is employed to obtain a direct enumeration of coliform organisms. The presence of coliforms indicates pollution by human or animal excrement, or by some non-faecal forms. The number of coliforms is reported per 100 millilitres (ml) of the sample. The membrane filter technique was used in the examination of these samples. It is the opinion of the OWRC that the presence of coliforms in a watercourse should not exceed 2,400 organisms per 100 ml. of water.

SAMPLE RESULTS

The laboratory results are shown in appendices to this report as follows:

Table I - Watercourses at Village of Petawawa

Table II - Outfalls to Watercourses at Village of Petawawa.

Watercourses at Village of Petawawa

According to the results of analyses which were performed, the quality of the water in the Petawawa River was within acceptable limits for surface water at the time of sampling. The presence of a slight content of detergent in the water sample obtained from the river at the proposed bathing area indicates the influence of domestic or industrial wastewater on the river.

The presence of detergent in the sample obtained from the tributary of the Petawawa River within the village is attributed to the influence of the discharge from the Woodlawn Mobile Homes Limited waste stabilization pond.

The quality of the Ottawa River water at the public bathing area was satisfactory on August 11, according to the sample results.

Outfalls to Watercourses at Village of Petawawa

The laboratory results reveal the unsatisfactory quality of the industrial and sanitary sewage discharging from the premises of Giesebrecht's Limited to the Petawawa River. Although the BOD of this waste was appreciable, the relatively low value revealed is attributed to the diluting effect of water which is used extensively for bottle-washing and other requirements at this plant. The coliform content of the waste discharge was excessive.

The wastewater discharging from the Petawawa DeLuxe Cleaners and Launderers Limited plant to the Petawawa River was sampled at a waste sump located in the rear part of the building. The laboratory results indicate that the waste should not be discharged to a water-course without adequate prior treatment. This waste disposal procedure was inspected by OWRC staff on January 13, 1965, and the pertinent report recommended that appropriate action should be taken to exclude the untreated waste from the river. It was apparent on August 12, 1965, that such action had not been taken.

Samples were collected from the Woodlawn Mobile Homes Limited sewage lagoon in an attempt to appraise the treatment efficiency of this facility. It was not readily possible to obtain samples of the influent flows. The following sample results provide a general assessment of treatment efficiency on August 11, 1965:

<u>Location of Sample</u>	<u>5-Day BOD (ppm)</u>	<u>Filtered BOD (ppm)</u>	<u>SOLIDS (ppm)</u>			<u>Anionic Detergents as ABS</u>	<u>Coli- forms/ 100 ml. M.F.</u>
			<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>		
Lagoon at east side (Influent)	17.0	11.0	328	146	182	2.5	0
Lagoon Effluent	18.0	5.2	426	120	306	2.8	4,900

The coliform content was appreciable in the effluent and could indicate the need for disinfection on a seasonal basis if the proposal to establish a bathing area on the Petawawa River should proceed. Although the inlet works could not be observed at the lagoon,

it is possible that both the inlet and outlet are located on the sides of this rectangular-shaped facility and, if this is so, short-circuiting could occur. When a lagoon of this shape is utilized, it is desirable to construct the inlet and outlet works at opposite ends, not at the sides. It is apparent that the principals who constructed the waste stabilization pond did not submit plans to the OWRC as is required.

SUMMARY

A water pollution survey of the Village of Petawawa was performed by OWRC staff during the period of August 10 to 12, 1965. Investigations were made to obtain information concerning any discharges to watercourses within the village, and to determine the influence exerted thereby on the quality of the watercourses.

The DND (Department of National Defence) sewage treatment plant is located east of the Village of Petawawa and receives sewage from a limited section of the municipality. The major part of the village relies on private sub-surface systems for the disposal of sewage. It was apparent during the survey that sewage disposal problems are not extensive in Petawawa.

The municipal water distribution system receives treated water from the DND water purification plant and conducts this supply to approximately 90 per cent of the village residents.

Untreated industrial waste is discharged to the Petawawa River from the premises of Giesebrecht's Limited and Petawawa DeLuxe

Cleaners and Launderers Limited. Partly treated sanitary waste is discharged also from the former plant to the river. The aforementioned premises require adequate methods of waste disposal. These plants are not located near those sections of the village which are served by sanitary sewers. Limited land area is available at these respective premises for the construction of adequate sub-surface sewage disposal systems. A tributary of the Petawawa river receives the effluent from the waste stabilization pond which serves the Woodlawn Mobile Homes Limited premises.

RECOMMENDATIONS

1. Although sewage disposal problems apparently are not numerous in the Village of Petawawa, progressive development of the municipality will necessitate additional consideration with respect to public sewage works.
2. Officials of Giesebrecht's Limited and Petawawa DeLuxe Cleaners and Launderers Limited should devise methods to exclude untreated or inadequately treated sewage flows from the Petawawa River.
3. The principals of Woodlawn Mobile Homes Limited should ensure that adequate supervision of their waste stabilization pond in Petawawa is provided.

All of which is respectfully submitted,

Approved by: L. G. South
L. G. South,
Acting District Engineer,
Division of Sanitary Engineering.

Prepared by: R. G. Barrens
/mh

TABLE I

WATERCOURSES AT VILLAGE OF PETAWAWA

<u>Mileage Point Number</u>	<u>Date of Sample 1965</u>	<u>Description</u>	<u>5-Day BOD</u>	<u>SOLIDS</u>			<u>Anionic Detergents as ABS</u>	<u>BACTERIOLOGICAL EXAMINATION</u>
				<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>		<u>Coliforms per 100 ml. (M.F.)</u>
P 0.42	Aug. 11	Petawawa River upstream from its mouth	0.6	68	2	66	0.0	1,500
P 1.37	Aug. 11	Petawawa River at proposed bathing area near D.N.D. storm sewer outlet	0.5	81	3	78	0.1	330
P 2.24	Aug. 11	Petawawa River at railway bridge in upstream part of village	0.5	52	1	51	0.0	16
PX 2.21	Aug. 11	Tributary of Petawawa River downstream from Woodlawn Mobile Homes Ltd. Lagoon outfall	2.8	200	11	189	0.3	700
PX 2.63	Aug. 11	Aforementioned tributary of Petawawa River at Audrey Street	4.0	234	52	182	---	500
O 250.9	Aug. 11	Ottawa River at Public Bathing Area	0.6	50	2	48	0.0	430

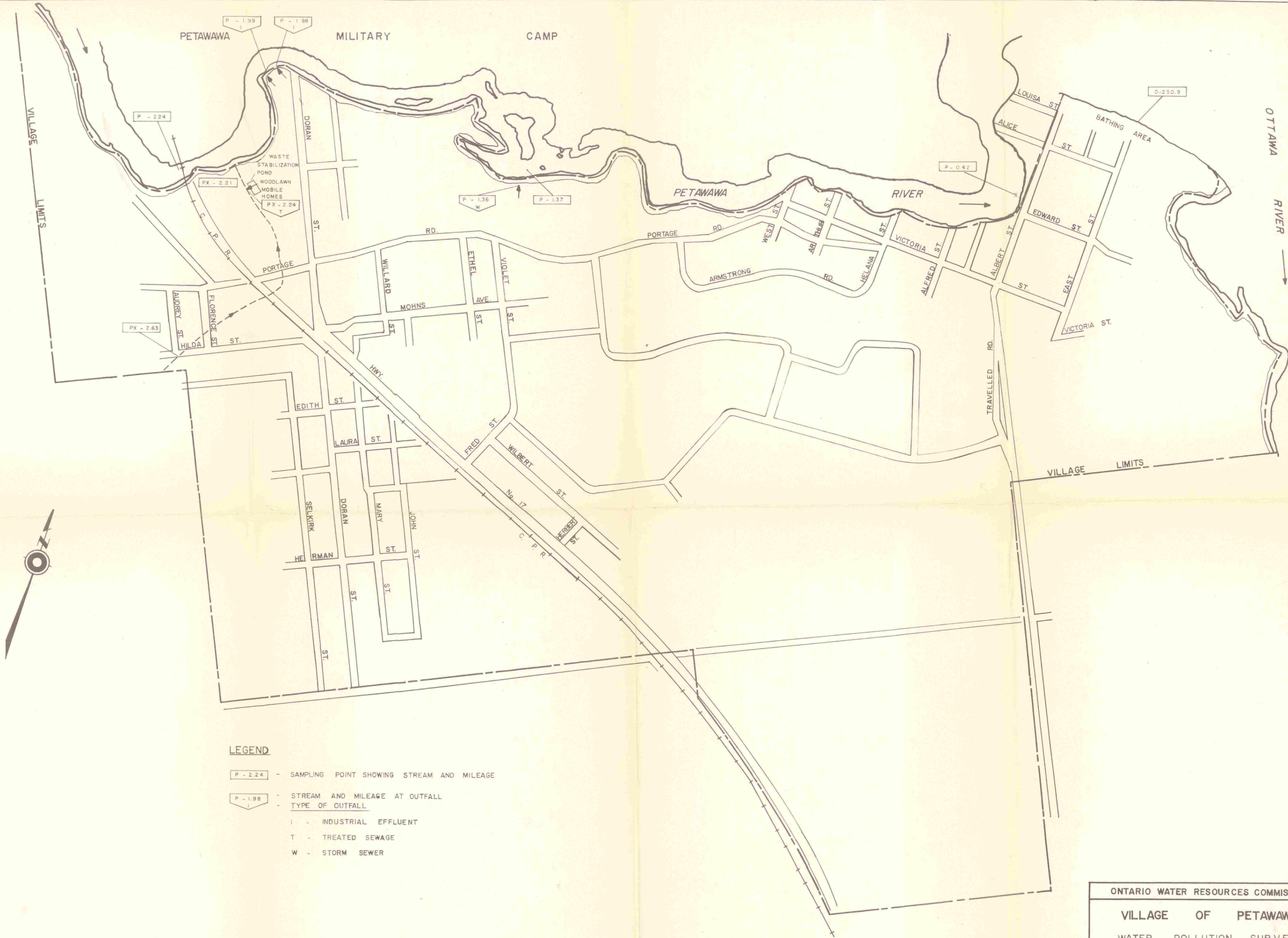
NOTE: All Analyses except pH reported in ppm unless otherwise indicated.

TABLE II

OUTFALLS TO WATERCOURSES IN VILLAGE OF PETAWAWA

MILEAGE POINT NUMBER	DATE OF SAMPLE 1965	DESCRIPTION	5-DAY BOD	SOLIDS			PH	ALKALINITY AS CaCO ₃	ANIONIC DETERGENTS		FILTERED BOD	BACTERIOLOGICAL EXAMINATION COLIFORMS PER 100 ML. (M.F.)
				TOTAL	SUSP.	DISS.			AS	ABS		
P 1.36 W	Aug. 11	Department of National Defence storm sewer out- let on South Bank of Petawawa River					N O	F L O W				
P 1.98 I	Aug. 12	Outfall from Giese- brecht's Ltd. plant to Petawawa River	17.0	210	31	179	7.2	66	0.3			700,000
P 1.99 I	Aug. 12	Outfall from Petawawa DeLuxe Cleaners and Launderers Ltd. plant to Petawawa River (Sample collected in plant)	37.0	362	80	282	8.2	156	3.1			0
PX 2.24 T	Aug. 11	Discharge from Wood- lawn Mobile Homes Ltd. waste stabilization pond to tributary of Petawawa River	18.0	426	120	306			2.8		5.2	4,900

NOTE: All Analyses except pH reported in ppm unless otherwise indicated.



LEGEND

- P - 2.24 - SAMPLING POINT SHOWING STREAM AND MILEAGE
- P - 1.98 - STREAM AND MILEAGE AT OUTFALL
I - TYPE OF OUTFALL
- I - INDUSTRIAL EFFLUENT
T - TREATED SEWAGE
W - STORM SEWER

ONTARIO WATER RESOURCES COMMISSION

VILLAGE OF PETAWAWA

WATER POLLUTION SURVEY

1966

SCALE: 600 0 600 1200 FT.

DRAWN BY: M.I.H. DATE: JULY 1966

CHECKED BY: R.W. DRAWING NO: 66-45